SLS STEWART LUBRICANTS & SERVICE CO., INC.

Automatic Lubrication Systems

SLS STEWART LUBRICANTS & SERVICE CO., INC.

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Benefits of automatic lubrication

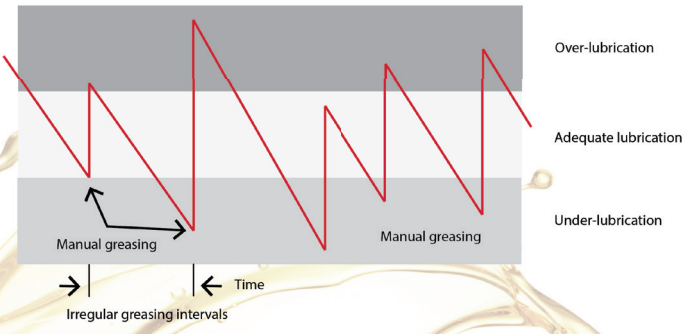
The key to prevent bearing failures is to ensure that all maintenance personnel are trained on proper lubrication techniques since the risks to lose a bearing varies on a range of factors such as bearing size, type, speed, temperature, vibration and most importantly lubrication condition.

Bearing relubrication addresses the need to maintain sufficient fresh grease around the working components of bearings as they rotate. Insufficient or infrequent relubrication leads to deterioration of lubrication conditions, lubricant starvation, and premature wear. Meanwhile, for high speed bearings, the rapid supply of excessive amounts of grease can cause over-lubrication which leads to degradation of grease condition and threatens the service life of bearings.

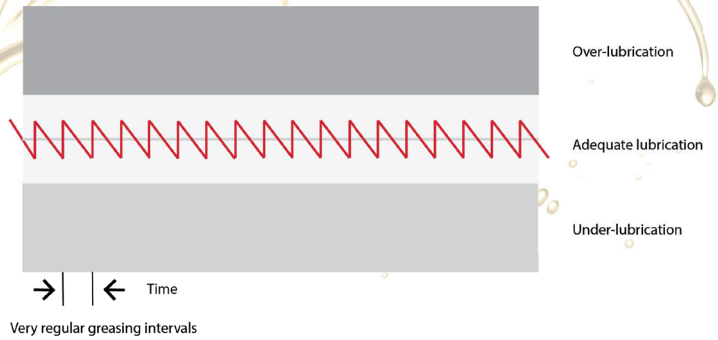
Greasing solutions like an automated lubrication system prevents the ingress of contaminants and therefore provides long-term financial returns by means of longer bearing service life, reduced maintenance costs and downtime.

Benefits of Short Time Relubrication

Manual Greasing



Automated Greasing



Too little grease

- Starvation causing premature wear
- Under-lubrication leads to accelerated degradation of remaining grease
- Increased potential for contamination entry due to lack of lubricant purge

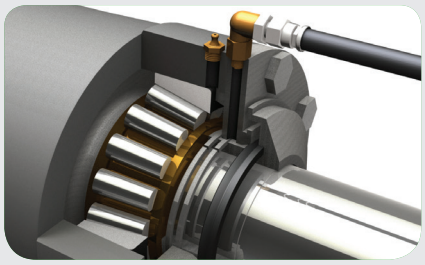
Too much grease

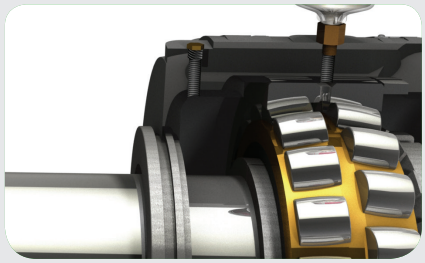
- Potential for elevated operating temperature and rapid degradation of grease for high speed bearings
- Less efficient use of fresh grease
- Potential to damage contact type seals

To extend bearing life, SLS lubrication systems deliver small volumes of lubricant at short time intervals. This method of grease delivery reduces the likelihood of lubricant starvation or over-lubrication from occurring while reducing the workload for maintenance personnel and extending bearing service life and delivers a reliability advantage.

Contamination Prevention

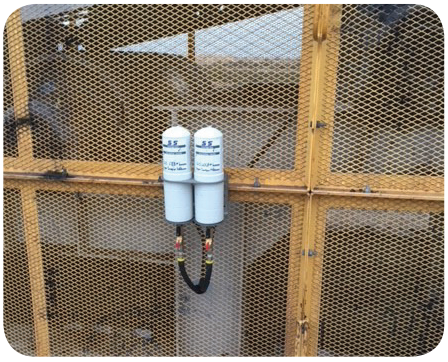
The consistent and regular purge of fresh grease through seals helps to prevent the entry of damaging contaminants. Bearings operating in harsh environment are inevitably subjected to sources of contamination by solid particulates and moisture. Bearings are contained within a housing from which a shaft extends. The shaft entry into the housing offers opportunity for dust and moisture to enter the bearing. Choosing the appropriate automatic lubrication solution as well as the seal configuration protects against dust and moisture which is critical to extending bearing life.


Workplace Safety

Workplace safety is of ultimate importance. Reliable systems which reduce the interface between people and operating equipment are a key element to reduce the likelihood of workplace accidents. The use of SLS automatic lubrication systems significantly minimize workplace accidents and the time required to lubricate equipment. Opportunities for safety improvements include the relocation of lubrication points away from operating machinery, elimination of working at heights requirements and the general reduction of manual labor associated with manual greasing.



Lubrication system mounted on the outside of a safety cage of a conveyor application.

Challenges

- Access to lubrication points located behind safety cages or guards
- Access to lubrication points located at heights or in confined spaces
- Minimization of repetetive manual tasks

Solutions

- Remote mounting at safe to access locations
- Lubrication systems can prevent frequent working confined spaces and heights
- Lubrication systems can save time by automating time consuming manual tasks and will help minimize repetitious use of manual grease guns

STEP 1
Industry / Application

Stewart Lubricants & Service Co., Inc. provides a single source for lubrication equipment, system design, installation, service, lubricants and technical support. If you are facing lubrication problems, we make it our mission to solve them.

Our easy 4 step procedure helps you to find the right lubrication solution for your application.

1 STEP 1: Assess Industry / Application

2 STEP 2: Assess Installation Method

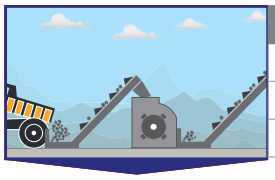
3 STEP 3: Assess Lubrication System / Lubricant

4 STEP 4: Assess Mounting solutions & Accessories

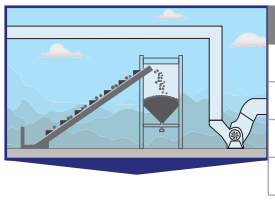
Focus Mining and Heavy Industry

In order to maintain their competitiveness, mining and heavy industry companies, such as coal mines, must increase productivity and simultaneously minimize long-term operating costs. One important component in this context is preventive maintenance, which extends equipment service life and minimizes downtime required for maintenance, repairs and overhauls. This reduces operating costs and enhances company performance.

1 Roller bearings 2 Sliding bearings 3 Shaft seals



		1	2	3
Mining and transport of raw materials				
→ **Mining**	Conveyor excavators, conveyor shovels	✓	✓	✓
→ **Crushing**	Jaw, cone & roll crushers	✓	✓	-
→ **Transport**	Conveyors, pumps	✓	-	✓



Processing to final product				
→ **Screening**	Raw material screens	✓	✓	-
→ **Sorting & cleaning**	Conveyors, pumps, mixer gears	✓	-	✓
→ **Dust removal**	Dedusting equipment, fans	✓	-	✓
→ **Transport**	Conveyors	✓	-	✓

Storage & transport				
→ **Storage**	Conveyors	✓	-	✓
→ **Transport**	Conveyors, loading stations	✓	-	✓

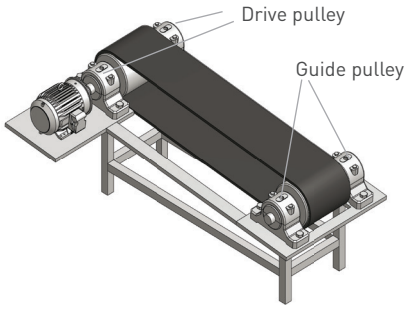
Application Assessment Criteria

Applications

Assessment criteria

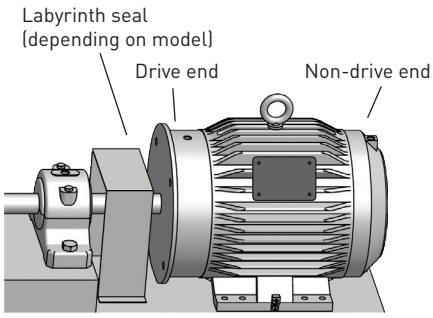
Solutions

Conveyor



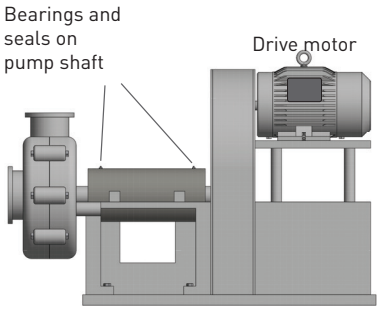
- ✓ Bearing types and speeds
- ✓ Operating conditions
- ✓ Access requirements
- ✓ Grease performance characteristics
- ✓ Location of grease entry points on bearing housing
- ✓ Seal types

Electric Motor



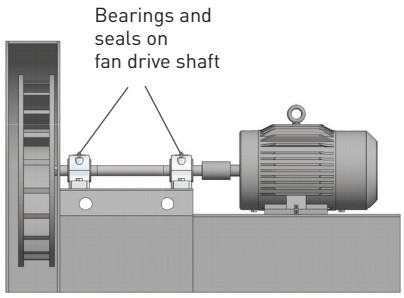
- ✓ OEM recommendations
- ✓ Motor Speed
- ✓ Grease escape design, access and condition
- ✓ Operating conditions
- ✓ Lubricant
- ✓ Bearing types
- ✓ Access requirements
- ✓ Service Schedule
- ✓ Motor orientation (vertical or horizontal)

Pump



- ✓ OEM recommendations
- ✓ Seal types
- ✓ Wash down procedures
- ✓ Operating conditions
- ✓ Characteristics of lubricant
- ✓ Bearing type and grease entry points
- ✓ Service schedule
- ✓ Duty Cycle
- ✓ Operating temperatures

Blower / Fan



- ✓ Bearing types and speed
- ✓ Operating conditions
- ✓ Access requirements
- ✓ Grease performance characteristics
- ✓ Grease base oil viscosity
- ✓ Location of grease entry points on bearing housing
- ✓ Seal types
- ✓ Service schedule
- ✓ Bearing temperatures

STEP 2
Assess Installation Method

B. Beam clamp

Easy-to-use beam clamps, supplied with case-hardened cup head set screws and stainless steel assembly screws. **Available in 1.18 inch or 2.56 inch (30 or 65 mm)**

C. Purge connection with manual valve 1/4" NPT

Used for convenient additions of supplementary grease, line purging ,and grease blockage clearing.

D. Angle 90° 1/4" NPT male x 1/4 NPT female

Optional use. One angle included per lubrication point.

E. Hose connector 1/4" NPT male

For hose iØ 3/8 push-lock (brass). Two included per lubrication point.

F. Heavy Duty hose

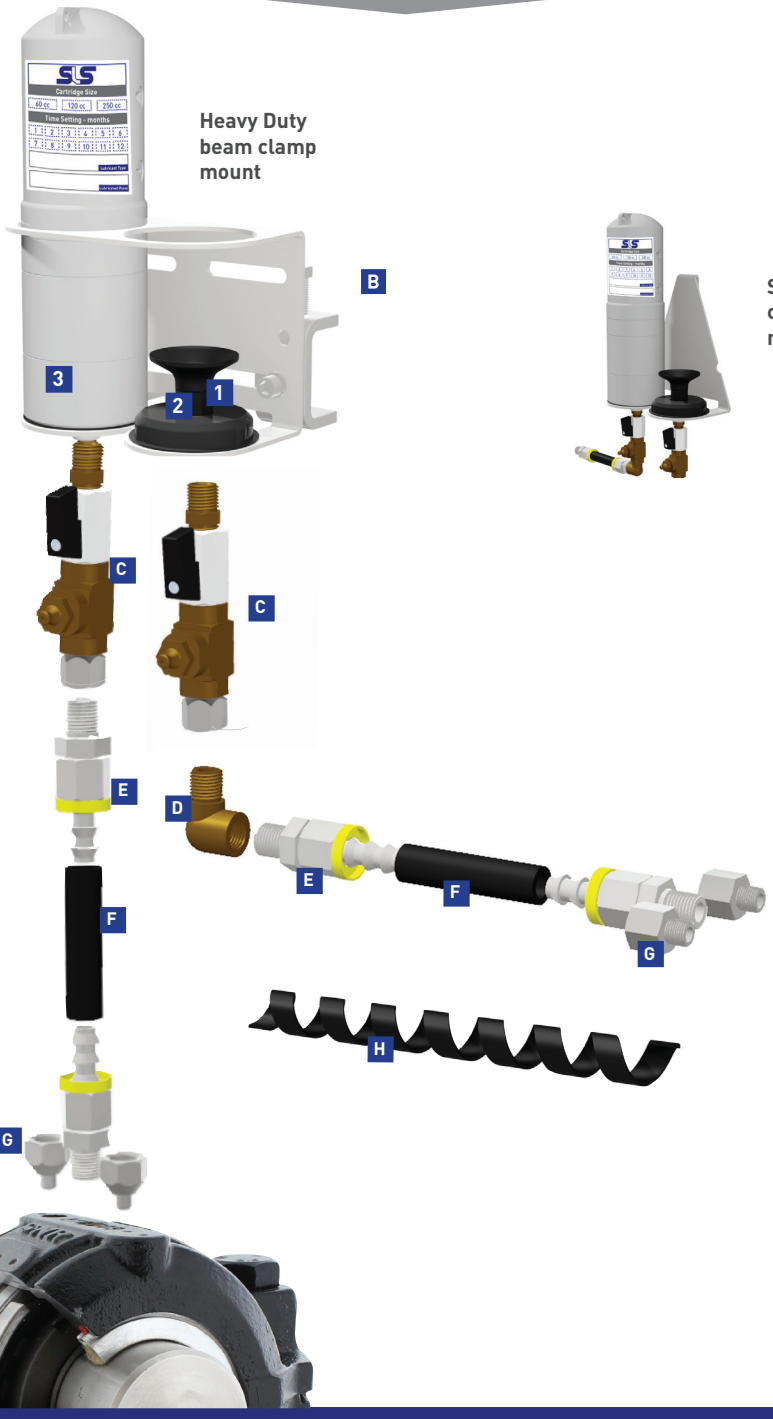
Supplied with iØ 3/8 and easy-to-use push-lock type swivel hose ends. Hose 6 ft / 2 m per lubrication point is included, other lengths upon request.

G. Reducing adapter

Two reducers 1/8" NPT and 1/4-28 UNF included for each lubrication point.

H. Hose spiral guard

Use to bundle hoses in multi-point kits.



For many lubrication points it is beneficial to remote mount lubrication systems at locations which are safe to access while machinery is operating. The following questions can be used to help guide remote mounting decisions.

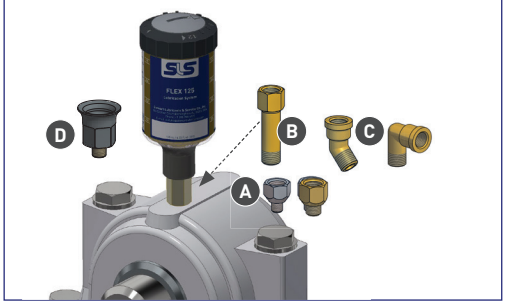
REMOTE INSTALLATION DECISION MAKING

If you can answer with a „YES“ to any of these questions below, a remote mounting solution is most likely to be required

1. Is it necessary to remove protective guards or safety cages to access the lubrication point?
2. Is it difficult or unsafe to access the lubrication point while equipment is running?
3. Is the lubrication point subject to severe vibration or high temperatures which may damage the lubrication system?
4. Is it necessary to get permits to access lubrication points when in confined spaces or fall protection is required?
5. Is the lubrication point exposed to excessive amounts of water, process materials or impact from solid material?

NO
--> DIRECT MOUNTING

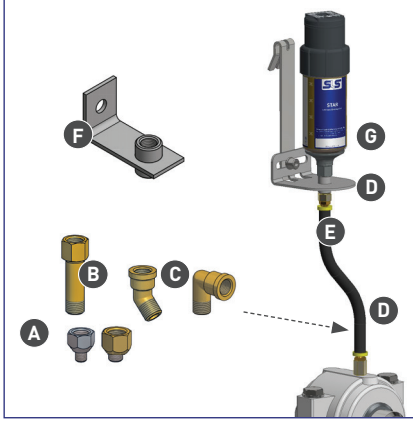
Direct mounting example for FLEX lubrication system



Common mounting accessories	
A	1 x Reducer 1/8" NPT male x 1/4" NPT female 1 x Reducer 1/4-28 UNF male x 1/4" NPT female 1 x Reducer M8x1o x G1/4 female
B	1 x Extension 2 inch 1/4" NPT male x 1/4" NPT female
C	1 x Angle 45° or 90° 1/4" NPT male x 1/4" NPT female
D	1 x Support flange FLEX Gen 2.0 1/4" NPT male x G1/4 female >> only for FLEX

YES
--> REMOTE MOUNTING

Remote mounting example for STAR VARIO lubrication system



Common remoute mounting accessories	
A	1 x Reducer 1/8" NPT male x 1/4" NPT female 1 x Reducer 1/4-28 UNF male x 1/4" NPT female 1 x Reducer M8x1o x G1/4 female
B	1 x Extension 2 inch 1/4" NPT male x 1/4" NPT female
C	1 x Angle 45° or 90° 1/4" NPT male x 1/4" NPT female
D	2 x Hose connector 1/4" NPT male for hose iØ 3/8 - push-lock (brass)
E	1 x Heavy Duty hose up to 260 °F / 100 °C iØ 3/8 (black)
F	1 x Mounting bracket 1-point G1/4 female single for STAR VARIO
G	1 x Support flange STAR Gen 2.0 G1/4 male x G1/4 female

STEP 3
Assess Lubrication System / Lubricant

	FLEX	STAR VARIO
		
Specifications		
SET	**Rotary switch**  Complete system	**Push button + LCD display + LED signals red/green**  Reusable STAR VARIO Drive
°F °C	**-4 °F to 140 °F** -20 °C to 60 °C	**14 °F to 140 °F** -10 °C to 60 °C
	max. 73 psi max. 5 bar	**87 psi** 6 bar
cc / oz	**60, 125 cc** 2.03 oz / 4.23 oz	**60, 120, 250 cc** 2.03 oz / 4.06 oz / 8.45 oz
	Electrochemical	**Electromechanical Battery pack STAR VARIO**
	Discharge period can be altered at any time/system can be shut down	
	1, 2, 3 ... 12 months at 68 °F / 20 °C /	**1, 2, 3 ... 12 months** independent of operating temperature and counter pressure
	IP 68	**IP 65**
	CE Ex IECEx FM APPROVED TIIS	CE cULus LISTED
Special operating conditions		
	Minor to moderate vibration	**Minor to heavy vibration**
	< 6 ft / 2 meters grease line	**< 15 ft / 5 meters grease line**

Lubricants

Name	NLGI grade	Thickener	Base oil	Operating temperature (°F)	Operating temperature (°C)	Base oil viscosity at 40 °C [mm²/s]	Roller bearings	Sliding bearings Sliding guides	Open gears Gear racks	Spindles
SLS lubricants										
SLS EP Grease	1/2	Lithium	Mineral	0 to 300	-18 to 149	720	✔	✔	-	-
SLS EPLCCB Grease	1/2	Li com	Mineral	0 to 400	-18 to 204	145	✔	✔	-	-
Arctic EP #0	0	Lithium	Mineral	-40 to 0	-40 to -17	50	✔	✔	-	-
Common industrial lubricants										
EXXON MOBIL Polyrex EM	2	Poly-urea	Mineral	- 20 to 350	-29 to 177	115	✔	-	-	-
EXXON MOBIL Mobilith SHC 100 / 220 / 460	1.5/2	Li com	Synthetic	- 40 to 302	- 40 to 150	100/ 220/ 460	✔	✔	✔	-
EXXON MOBIL Centaur XHP 461	1	Ca-Sul	Mineral	up to 450	up to 232	460	✔	-	-	-
Phillip 66 Polytac	2	Poly-urea	Paraffinic	-30 to 325	- 34 to 163	110	✔	-	-	-
Phillips 66 Triton 220	2	Li com	Synthetic	- 40 to 350	- 40 to 177	220	✔	✔	-	-
Chevron SRI 2	2	Poly-urea	Synthetic	- 30 to 350	- 30 to 177	100	✔	-	-	-
Shell GadusRail S2 Traction Motor Bearing Grease	3	Li com	Mineral	-4 to 248	-20 to 120	93	✔	✔	-	-
Shell Gadus S2 V100	2	Li - Hydro	Mineral	- 22 to 266	-30 to 130	100	✔	✔	-	-
Shell Gadus S5 V100 2 (Albida EMS 2)	2	Li com	Synthetic	- 58 to 302	-50 to 150	100	✔	-	-	-
Shell Gadus S5 T100 2	2	Poly-urea	Synthetic	- 40 to 356	-40 to 180	100	✔	-	-	-
EXXON MOBIL MOBILGREASE XHP 220 / 221 / 222	0/1/2	Li com	Mineral	- 4 to 284	-20 to 140	220	✔	✔	-	-
Phillip 66 Polytac EP 2	2	Poly-urea	Mineral	-30 to 325	- 34 to 163	129	✔	-	-	-
ULTI-PLEX GREASE EP NLGI 1 / 2	1/2	Li com	Mineral	- 22 to 350	- 30 to 177	320	✔	✔	-	-
Shell Gadus S3 V220C 2 (Albida EP2)	2	Li com	Mineral	- 4 to 284	-20 to 140	220	✔	✔	✔	-
Chemlith EP-0-A	0	Li 12-Hydro	Mineral	- 4 to 302	-20 to 150	180	✔	-	-	-

STEP 4
Assess Mouting Solutions & Accessories

1 **STEP 1:** Assess Industry / Application

2 **STEP 2:** Assess Installation Method

3 **STEP 3:** Assess Lubrication System / Lubricant

4 **STEP 4:** Assess Mounting Solutions & Accessories

Typical kit configuration shown below. SLS lubrication systems not included in INSTALLATION KIT.
Different kit configuration available upon request.

INSTALLATION KIT Standard Duty Beam Clamp Mount

		
	INSTALLATION KIT FLEX Standard Duty 1-point beam clamp mount incl. 3 ft / 1 m hose	**INSTALLATION KIT FLEX Standard Duty 2-point beam clamp mount incl. 6 ft / 2 m hose**
 1.18 inch 30 mm	901046	901048
 2.56 inch 65 mm	901047	901049

INSTALLATION KIT Standard Duty Cage Hanger Mount

		
	INSTALLATION KIT FLEX Standard Duty 1-point cage hanger mount incl. 3 ft / 1 m hose	**INSTALLATION KIT FLEX Standard Duty 2-point cage hanger mount incl. 6 ft / 2 m hose**
	901050	901051

Typical kit configuration shown below. SLS lubrication systems not included in INSTALLATION KIT.
Different kit configuration available upon request.

INSTALLATION KIT Standard & Heavy Duty Beam Clamp Mount

				
	INSTALLATION KIT STAR Standard Duty 1-point beam clamp mount incl. 6 ft / 2 m hose	**INSTALLATION KIT STAR Standard Duty 2-point beam clamp mount incl. 12 ft / 4 m hose**	**INSTALLATION KIT STAR Heavy Duty 1-point beam clamp mount incl. 6 ft / 2 m hose**	**INSTALLATION KIT STAR Heavy Duty 2-point beam clamp mount incl. 12 ft / 4 m hose**
 **1.18 inch 30 mm**	907000	907002	907004	907006
 **2.56 inch 65 mm**	907001	907003	907005	907007

INSTALLATION KIT Standard & Heavy Duty Cage Hanger Mount

			
INSTALLATION KIT STAR Standard Duty 1-point cage hanger mount incl. 6 ft /2 m hose	**INSTALLATION KIT STAR Standard Duty 2-point cage hanger mount incl. 12 ft / 4 m hose**	**INSTALLATION KIT STAR Heavy Duty 1-point cage hanger mount incl. 6 ft / 2 m hose**	**INSTALLATION KIT STAR Heavy Duty 2-point cage hanger mount incl. 12 ft / 4 m hose**
907008	907009	907010	907011

INSTALLATION KIT Rail Mount (up to 1 inch)

	
INSTALLATION KIT STAR 1-point rail mount incl. 6 ft / 2 m hose	**INSTALLATION KIT STAR 2-point rail mount incl. 12 ft / 4 m hose**
907012	907013

INSTALLATION KITS ALSO AVAILABLE IN 3- AND 4- POINTS

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